

IN THE CLAIMS

1. (Currently amended) A chemical filter medium comprising:
a first ozone absorption layer that is substantially planer for removing ozone, the first ozone absorption layer including a first filtering base material for removing ozone;
a first nitrogen oxide absorption layer that is substantially planer for removing nitrogen oxide formed on the first ozone absorption layer, the first nitrogen oxide absorption layer including a filtering base material for removing nitrogen oxide; and
a second ozone absorption layer that is substantially planer for removing ozone formed on the first nitrogen oxide absorption layer, the second ozone absorption layer including a second filtering base material for removing ozone,
wherein each of the first ozone absorption layer, first nitrogen oxide absorption layer, and the second ozone absorption layer are directly disposed on each other.
2. (Original) The chemical filter medium of claim 1, wherein each of the first and second filtering base materials for removing ozone includes activated carbon and an impregnating agent in the activated carbon.
3. (Original) The chemical filter medium of claim 2, wherein the impregnating agent includes a metal oxide.
4. (Original) The chemical filter medium of claim 2, wherein the impregnating agent includes one of potassium hydroxide and manganese monoxide.
5. (Original) The chemical filter medium of claim 2, wherein the impregnating agent is present in an amount of from about 5 to about 10 weight percent, based on a weight of the activated carbon.
6. (Original) The chemical filter medium of claim 1, wherein the filtering base material for removing nitrogen oxide includes zeolite and an impregnating agent in the zeolite.

7. (Original) The chemical filter medium of claim 6, wherein the impregnating agent includes a metal oxide.

8. (Original) The chemical filter medium of claim 6, wherein the impregnating agent includes potassium permanganate.

9. (Original) The chemical filter medium of claim 8, wherein the potassium permanganate is present in an amount of from about 10 to about 15 weight percent based on a weight of the zeolite.

10. (Original) The chemical filter medium of claim 1, wherein the first ozone absorption layer is positioned at a front portion of the filter medium with respect to the direction of air flow, and the first ozone absorption layer has a thickness greater than that of the first nitrogen oxide absorption layer.

11. (Original) The chemical filter medium of claim 1, wherein the first ozone absorption layer has a thickness substantially the same as that of the first nitrogen oxide absorption layer.

12. (Original) The chemical filter medium of claim 1, wherein the second ozone absorption layer has a thickness substantially the same as the thickness of the first nitrogen oxide absorption layer.

13. (Original) The chemical filter medium of claim 1, wherein the first ozone absorption layer is positioned at a front portion of the filter medium with respect to the direction of air flow, and the second ozone absorption layer has a thickness which is less than that of the first nitrogen oxide absorption layer.

14. (Original) The chemical filter medium of claim 1, further comprising a second nitrogen oxide absorption layer and a third ozone absorption layer sequentially formed on the second ozone absorption layer.

15. (Original) The chemical filter medium of claim 14, wherein each of the first, second and third ozone absorption layers have a thickness substantially the same as the thickness of each of the first and second nitrogen oxide absorption layers.

16. (Original) A chemical filter medium comprising:

a first layer for removing ozone, the first layer including a filtering base neutral material and a catalyst for reducing ozone impregnated in the filtering base neutral material;

a second layer for removing nitrogen oxide formed on the first layer, the second layer including a filtering base oxide material and a catalyst for decomposing and removing nitrogen oxide impregnated in the filtering base oxide material; and

a third layer for removing ozone formed on the second layer, the third layer including a filtering base neutral material and a catalyst for reducing ozone impregnated in the filtering base neutral material.

17. (Original) The chemical filter medium of claim 16, wherein the first layer has a thickness substantially the same as that of the second layer.

18. (Original) The chemical filter medium of claim 16, wherein the second layer has a thickness substantially the same as that of the third layer.

19. (Original) The chemical filter medium of claim 16, wherein each of the filtering base neutral materials of the first and third layers includes activated carbon.

20. (Original) The chemical filter medium of claim 16, wherein each catalyst for reducing ozone of the first and third layers includes either one of potassium hydroxide and manganese monoxide.

21. (Original) The chemical filter medium of claim 16, wherein the filtering base oxide material of the second layer includes zeolite.

22. (Original) The chemical filter medium of claim 16, wherein the catalyst for decomposing and removing nitrogen oxide of the second layer includes potassium permanganate.

23. (Original) The chemical filter medium of claim 16, wherein the filtering base oxide material includes an impregnating agent including a metal oxide.

24. (Original) The chemical filter medium of claim 16, further comprising:
a fourth layer for removing the nitrogen oxide formed on the third layer, the fourth layer including a filtering base oxide material and a catalyst for decomposing and removing the nitrogen oxide impregnated in the filtering base oxide material; and

a fifth layer for removing ozone formed on the fourth layer, the fifth layer including a filtering base neutral material and a catalyst for reducing ozone impregnated in the filtering base neutral material.

25. (Currently amended) A chemical filter comprising:
a tray having an upper case, and a lower case connected to the upper case;
a first ozone absorption layer that is substantially planer for removing ozone located at a lower portion of the lower case, wherein the first ozone absorption layer includes a filtering base material for removing ozone;

a first nitrogen oxide absorption layer that is substantially planer for removing nitrogen oxide located on the first ozone absorption layer in the lower case, wherein the first nitrogen oxide absorption layer includes a filtering base material for removing nitrogen oxide; and

a second ozone absorption layer that is substantially planer for removing ozone located on the first nitrogen oxide absorption layer in the lower case, wherein the second ozone absorption layer includes a filtering base material for removing ozone, and wherein each of the first ozone absorption layer, first nitrogen oxide absorption layer, and the second ozone absorption layer are directly disposed on each other.

26. (Original) The chemical filter of claim 25, wherein each of the filtering base materials for removing ozone includes activated carbon and an impregnating agent in the activated carbon.

27. (Original) The chemical filter of claim 26, wherein the impregnating agent includes one of potassium hydroxide and manganese monoxide.

28. (Original) The chemical filter of claim 25, wherein the filtering base material for removing nitrogen oxide includes zeolite and an impregnating agent in the zeolite.

29. (Original) The chemical filter of claim 28, wherein the impregnating agent includes potassium permanganate.

30. (Original) The chemical filter of claim 25, further comprising:
a second nitrogen oxide absorption layer formed on the second ozone absorption layer in the lower case; and
a third ozone absorption layer formed on the second nitrogen oxide absorption layer in the lower case.

31. (Original) The chemical filter of claim 25, further comprising a non-woven fabric formed inside of the tray.

32. (Original) The chemical filter of claim 31, further comprising a mesh attached to the non-woven fabric to protect the non-woven fabric.

33. (Currently amended) A method of manufacturing a chemical filter comprising:
providing a tray including an upper case and a lower case, respectively;
introducing a first ozone absorption layer that is substantially planer into the lower case of the tray, wherein the first ozone absorption layer includes a filtering base material for removing ozone;
forming a first nitrogen oxide absorption layer that is substantially planer on the first ozone absorption layer in the lower case, wherein the first nitrogen oxide absorption layer includes a filtering base material for removing nitrogen oxide;

forming a second ozone absorption layer that is substantially planer on the first nitrogen oxide absorption layer in the lower case, wherein the second ozone absorption layer includes a filtering base material for removing ozone; and

connecting the upper case to the lower case, wherein the upper case covers the lower case, and wherein each of the first ozone absorption layer, first nitrogen oxide absorption layer, and the second ozone absorption layer are directly disposed on each other.

34. (Original) The method of claim 33, further comprising attaching a non-woven fabric inside of the tray before introducing the first ozone absorption layer.

35. (Original) The method of claim 33, wherein each of the filtering base materials for removing ozone includes activated carbon and an impregnating agent in the activated carbon.

36. (Original) The method of claim 35, wherein the impregnating agent is introduced into the activated carbon by an immersing process.

37. (Original) The method of claim 33, wherein the filtering base material for removing nitrogen oxide includes zeolite and an impregnating agent in the zeolite.

38. (Original) The method of claim 37, wherein the impregnating agent is introduced into the activated carbon by an immersing process.

39. (Original) The method of claim 33, further comprising sequentially forming a second nitrogen oxide absorption layer and a third ozone absorption layer on the second ozone absorption layer.

40. (New) A chemical filter medium comprising:
a first ozone absorption layer for removing ozone, the first ozone absorption layer including a first filtering base material for removing ozone;

a first nitrogen oxide absorption layer for removing nitrogen oxide formed on the first ozone absorption layer, the first nitrogen oxide absorption layer including a filtering base material for removing nitrogen oxide; and

a second ozone absorption layer for removing ozone formed on the first nitrogen oxide absorption layer, the second ozone absorption layer including a second filtering base material for removing ozone, wherein each of the first and second filtering base materials for removing ozone includes activated carbon and an impregnating agent in the activated carbon, and wherein the impregnating agent includes one of potassium hydroxide and manganese monoxide.

41. (New) A chemical filter medium comprising:

a first ozone absorption layer for removing ozone, the first ozone absorption layer including a first filtering base material for removing ozone;

a first nitrogen oxide absorption layer for removing nitrogen oxide formed on the first ozone absorption layer, the first nitrogen oxide absorption layer including a filtering base material for removing nitrogen oxide; and

a second ozone absorption layer for removing ozone formed on the first nitrogen oxide absorption layer, the second ozone absorption layer including a second filtering base material for removing ozone,

wherein the filtering base material for removing nitrogen oxide includes zeolite and an impregnating agent in the zeolite.

42. (New) A method of manufacturing a chemical filter comprising:

providing a tray including an upper case and a lower case, respectively ;

attaching a non-woven fabric inside of the tray;

after attaching a non-woven fabric inside of the tray, introducing a first ozone absorption layer into the lower case of the tray, wherein the first ozone absorption layer includes a filtering base material for removing ozone;

forming a first nitrogen oxide absorption layer on the first ozone absorption layer in the lower case, wherein the first nitrogen oxide absorption layer includes a filtering base material for removing nitrogen oxide;

forming a second ozone absorption layer on the first nitrogen oxide absorption layer in the lower case, wherein the second ozone absorption layer includes a filtering base material for removing ozone; and

connecting the upper case to the lower case, wherein the upper case covers the lower case.